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Statement / Scientific Evidence

Centers For Disease Control & Prevention

• Emerging Infectious Diseases

"Personal Hygiene and Methicillin - Resistant Staphylococcus Aureus Infection"

Methicillin - Resistant Staphylococcus Aureus (MRSA) infections outside the healthcare setting are an increasing concern. We conducted a case-control study to investigate an MRSA outbreak during 2002-2003 in a Missouri prison and focused on hygiene factors. Information on sociodemographic characteristics, medical history, and hygiene practices of study participants was collected by interview and medical record review. Logistic Regression was used to evaluate MRSA infection in relation to hygiene factors individually and as a composite hygiene score; potential confounding factors were controlled. Selected MRSA isolates were analyzed by pulsed-field gel electrophoresis (PFGE). MRSA infection was significantly associated with a low composite hygiene score. Transmission among prison inmates appeared to be responsible for this outbreak. PFGE analysis showed that isolates were indistinguishable and associated with community-onset MRSA infections in other U.S. prisons. Improving hygiene practices and environmental conditions may help prevent and interrupt future MRSA outbreaks in prison settings.

- Materials and Methods
Case-Control Study (see the report)
- Laboratory Investigation (see report)
- Results (see the report)
- Discussion

In this case-control study of a **MRSA** outbreak in a prison setting, poor personal hygiene practices were significantly associated with an increase risk for **MRSA** infection after controlling for sociodemographic and other risk factors. This outbreak was likely caused by transmission inside the prison because 90% of the case-patients had culture confirmation at least 90 days after prison admission, and subtyping by **PFGE** showed that 6 of the 7 isolates tested had identical **PFGE** patterns and 1 differed by only 1 band. These isolates belonged to pulsed-field type USA300 lineage, which is associated with community-onset **MRSA** infections in other correctional facilities and community outbreaks (11)

Based on literature review, outbreaks of **MRSA** infection are thought to be caused by the complex interaction of the environment contaminated by **MRSA**, indiscriminate use of antimicrobial drugs, and personal hygiene factors (12,13). In a crowded, institutionalized setting such as a prison, the interplay of such factors is more pronounced. As a result, many outbreaks have occurred in such settings (1,14). Hospital

environmental surfaces, healthcare workers gowns, and patient-care items contaminated by patients infected or colonized with MRSA have been shown to pose significant risks for MRSA transmission (12.15).

Boyce et al. (16) found that 73% of hospital rooms containing patients infected with MRSA and 69% of rooms containing patients colonized with MRSA had environmental contamination. Research also showed that the nurse's gloves became contaminated 42% of the time after they touched surfaces contaminated with the bacteria. Potential transmission of MRSA infection through contaminated surfaces and shared items was identified in a rural community by Baggett et al. (18) demonstrated that close contact with a person colonized or infected with MRSA resulted in a 7.5 fold greater risk of becoming colonized with MRSA. Persons colonized with MRSA also have an increased risk for MRSA infection (19.20). Based on the results of these studies and observations in this study, one can conclude that a prison environment can be easily contaminated by MRSA. Improved personal hygiene may provide protection for inmates living and working in such contaminated environments.

In this outbreak, a complex set of factors likely contributed to the spread of infection. These factors include improper care of infected skin lesions by inmates, poor personal hygiene by inmates, and close contact in confined space.

The findings of this study underscore the importance of the targeted education efforts to control MRSA outbreaks. Education about MRSA infection, especially the importance of proper personal hygiene, should be an integral part of efforts to eliminate and prevent MRSA infections and outbreaks. Such measures may be important in reducing the spread of MRSA in prison settings, where inherent rules and regulations complicate the implementation of certain control measures.